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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,771	03/26/2004	Alexander A. Maltsev	884.B95US1	9558

21186 7590 05/01/2007
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EXAMINER

JOSEPH, JAISON

ART UNIT	PAPER NUMBER
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2611

MAIL DATE	DELIVERY MODE
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05/01/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/810,771

Applicant(s)

MALTSEV ET AL.

Examiner

Jaison Joseph

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-19, 21-23 and 25-37 is/are rejected.
- 7) ☒ Claim(s) 10, 20 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

2. Claim 3 and 14 objected to because of the following informalities: claim 3, line 1 recite the limitation "the wideband channel" should have been " the wideband MIMO channel".

Similar scenario exists in claim 14, line 1. Appropriate correction is required.

3. Claim 31 is objected to because of the following informalities: Claim 31, line 1 recite the limitation " The machine-readable medium of claim 28" should have been " The machine-readable medium of claim 29". Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 29 – 31 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Regarding claim 29, the claim discloses software performing certain operations i.e.. discloses Functional descriptive material". However, "descriptive material" is nonstatutory when claimed as descriptive material.

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When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory. (page 50, paragraphs 1 – 2, Interim Guidelines). A recommended amendment to the claim is suggested "A computer-readable medium storing instructions...".

Claims 30 and 31 are inherently rejected as being depended on above rejected claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 1, 2, 5, 11, 22, 23, 25, 32 – 34, 36 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Supplement to IEEE Standard for IT-Telecommunications & Information Exchange Between Systems - Local and Metropolitan Area Networks - Specific Requirements. Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: High-Speed Physical Layer in 5GHZ Band, IEEE Standard 802.11a, Dec. 20 1999 IEEE standard hereinafter.

Regarding claim 1, IEEE standard teach a method of communicating over a high-throughput communication channel comprising: transmitting a channelization field as part of a current data unit, the channelization field indicating a frequency and space configuration of subsequent portions of the current data unit (see section 17.3 and

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figures 107 and 122); and transmitting a high-throughput training field in accordance with the frequency and space configuration indicated in the channelization field, the high-throughput training field to be used by a receiving station to estimate a channel matrix of the high-throughput communication channel (see section 17.3 and figures 107 and 122).

Regarding claim 2, which inherits the limitations of claim 1, IEEE standard further teach wherein the channelization field indicates whether the high-throughput communication channel comprises one of: a wideband channel having up to four frequency separated sub-channels; a multiple-input-multiple-output (MIMO) channel comprising a single sub-channel having up to four spatial sub channels with up to four distinct data streams transmitted thereon; and a wideband-MIMO channel comprising two or more frequency separated sub-channels wherein each sub-channel has two or more spatial channels (see section 17.3.8.3.3 Channelization and table 88).

Regarding claim 5, which inherits the limitations of claim 2, IEEE standard further teach wherein each sub-channel comprises a plurality of orthogonal frequency division multiplexed sub-carriers, and wherein each orthogonal frequency division multiplexed sub carrier has a null at substantially a center frequency of the other sub carriers to achieve substantial orthogonality between the sub carriers of the associated sub-channel (see section 17.3.8.3.3 Channelization and figure 117).

Regarding claim 11, which inherits the limitations of claim 1, IEEE standard further teach 1 further comprising transmitting a physical layer convergence protocol (PLCP) header field after the channelization field modulated in accordance with a

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modulation type indicated in the channelization field, wherein the PLCP header field comprises a mask to indicate fields of the PLCP header field, the fields including at least some of: a bit-loading per sub-channel, a coding rate, a length, a transmit power level, an available transmit power level, a frequency channelization request, a number of spatial channels request, a bit loading sub-channel request, a power loading per sub-channel request, a coding rate request, a transmit power request, and a duration recommendation (see section 17.3 and figure 107).

Regarding claim 22, the claimed frame structure including features corresponding to subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 23, which inherits the limitations of claim 22, the claimed frame structure including features corresponding to subject matter mentioned above in the rejection of claim 2 is applicable hereto.

Regarding claim 25, which inherits the limitations of claim 23 the claimed frame structure including features corresponding to subject matter mentioned above in the rejection of claim 11 is applicable hereto.

Regarding claim 32, the claimed method including features corresponding to subject matter mentioned above in the rejection of claim 1 is applicable hereto.

Regarding claim 33, which inherits the limitations of claim 32 the claimed method including features corresponding to subject matter mentioned above in the rejection of claim 2 is applicable hereto.

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Regarding claim 34, which inherits the limitations of claim 33, the claimed method including features corresponding to subject matter mentioned above in the rejection of claim 5 is applicable hereto.

Regarding claim 36, which inherits the limitations of claim 34, IEEE standard further teach wherein the transmitting comprises first transmitting the channelization field as part of the current data unit, and secondly transmitting the high-throughput training field as part of the current data unit (see figure 122, preamble s followed by header).

Regarding claim 37, which inherits the limitations of claim 34, IEEE standard further teach wherein transmitting comprises training the channelization field unit and the high-throughput training field as part of a single transmission of the current data unit (see figure 122),

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Fitton et al. (USPAP 2004/0085917).

Regarding claim 12, Fitton et al teach a transmitter comprising RF circuitry to transmit a channelization field on a compatibility sub channel (See figure 1c); and modulators to modulate a digital bit stream representing the channelization field with a rotated binary phase shift keying modulation of subcarriers of the compatibility channel (see figure 1c and paragraph 0042), wherein the channelization field is part of a current data and indicates a frequency and space configuration of subsequent portions of the current data unit (see figure 1C.).

Regarding claim 26, the claimed system including the features that corresponds to subject matter mentioned above in the rejection of claim 12 is applicable hereto.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Supplement to IEEE Standard for IT-Telecommunications & Information Exchange Between Systems - Local and Metropolitan Area Networks - Specific Requirements. Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: High-Speed Physical Layer in 5GHZ Band, IEEE Standard 802.11a, Dec. 20 1999 (IEEE standard hereinafter) in view of Tarokh et al. (USPAP 2004/0235529).

Regarding claim 3, which inherits the limitations of claim 2, IEEE standard further teach wherein the wideband channel has a wideband channel bandwidth of up to 80 MHz and comprises up to four of the sub-channels, wherein the sub-channels are non-overlapping orthogonal frequency division multiplexed channels, wherein each sub-channel has a sub-channel bandwidth of approximately 20 MHz and comprises a plurality of orthogonal sub carriers (see section 17.3.8.3.3 Channelization and table 88). IEEE standard does not expressly teach wherein the spatial channels are non-orthogonal frequency channels associated with one of the sub-channels whose orthogonality is achieved by beamforming. However in analogous art, Tarokh et al teach spatial channels are non-orthogonal frequency channels associated with one of the sub-channels whose orthogonality is achieved by beamforming (see paragraph 0117). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teachings of Tarokh et al in IEEE standard to reduce the interference.

Regarding claim 4, which inherits the limitations of claim 2, IEEE standard in view of Tarokh et al further teach wherein the spatial channels are generated with a plurality of transmit antennas of a transmitting station performing the transmitting, each spatial channel carrying a separate data portion of a data unit comprising an orthogonal frequency-division multiplexed symbol.

11. Claims 6 – 9 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Supplement to IEEE Standard for IT-Telecommunications & Information Exchange

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Between Systems - Local and Metropolitan Area Networks - Specific Requirements.

Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY)

Specifications: High-Speed Physical Layer in 5GHZ Band, IEEE Standard 802.11a,

Dec. 20 1999 (IEEE standard hereinafter) in view of Fitton et al. (USPAP

2004/0085917).

Regarding claim 6, which inherits the limitations of claim 2, IEEE standards does not expressly teach transmitting the channelization field comprises transmitting the channelization field on the compatibility channel with a rotated binary phase shift keying modulation of sub carriers of a compatibility channel. However in analogous art, Fitton et al teach transmitting the channelization field on the compatibility channel with a rotated binary phase shift keying modulation of sub carriers of a compatibility channel (see figure 1c and paragraph 0042). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to incorporate the transmitting the channelization field in rotated BPSK. The motivation or suggestion to do that is rotated BPSK does not require complex demodulation circuitry and is less susceptible to random phase changes in the transmitted waveform.

Regarding claim 7 and 8, which inherits the limitations of claim 6, it is inherent that the rotated BPSK have comprises rotating a symbol constellation representing data comprising the channelization field by either +90 or -90 degrees from the constellation of conventional BPSK modulation.

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Regarding claim 9, which inherits the limitations of claim 6, IEEE standard further teach encoding a digital bit stream representing data comprising the channelization field with a code of the current data unit (see figure 122).

Regarding claim 35, which inherits the limitations of claim 34, the claimed method including features corresponding to subject matter mentioned above in the rejection of claim 6 is applicable hereto.

12. Claims 13, 16 – 19, 21, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitton et al. (USPAP 2004/0085917) in view of Supplement to IEEE Standard for IT-Telecommunications & Information Exchange Between Systems - Local and Metropolitan Area Networks - Specific Requirements. Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: High-Speed Physical Layer in 5GHZ Band, IEEE Standard 802.11a, Dec. 20 1999 (IEEE standard hereinafter).

Regarding claim 13, which inherits the limitations of claim 12, Fitton et al do not expressly teach channelization field comprise at least one of wideband channel, a MIMO channel or a widebandMIMO channel. However in analogous art, IEEE standard wherein the channelization field indicates whether the high-throughput communication channel comprises one of: a wideband channel having up to four frequency separated sub-channels; a multiple-input-multiple-output (MIMO) channel comprising a single sub-channel having up to four spatial sub channels with up to four distinct data streams transmitted thereon; and a wideband-MIMO channel comprising

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two or more frequency separated sub-channels wherein each sub-channel has two or more spatial channels (see section 17.3.8.3.3 Channelization and table 88).

Regarding claim 16, which inherits the limitations of claim 13, IEEE standard further teach wherein each sub-channel comprises a plurality of orthogonal frequency division multiplexed sub-carriers, and wherein each orthogonal frequency division multiplexed sub carrier has a null at substantially a center frequency of the other sub carriers to achieve substantial orthogonality between the sub carriers of the associated sub-channel (see section 17.3.8.3.3 Channelization and figure 117).

Regarding claim 17 and 18, which inherits the limitations of claim 13, it is inherent that the rotated BPSK have comprises rotating a symbol constellation representing data comprising the channelization field by either +90 or -90 degrees from the constellations of conventional BPSK modulation.

Regarding claim 19, which inherits the limitations of claim 13, IEEE standard further teach encoding a digital bit stream representing data comprising the channelization field with a code of the current data unit (see figure 122).

Regarding claim 21, which inherits the limitations of claim 13, IEEE standard further teach 1 further comprising transmitting a physical layer convergence protocol (PLCP) header field after the channelization field modulated in accordance with a modulation type indicated in the channelization field, wherein the PLCP header field comprises a mask to indicate fields of the PLCP header field, the fields including at least some of: a bit-loading per sub-channel, a coding rate, a length, a transmit power level, an available transmit power level, a frequency channelization request, a number of

spatial channels request, a bit loading sub-channel request, a power loading per sub-channel request, a coding rate request, a transmit power request, and a duration recommendation (see section 17.3 and figure 107).

Regarding claim 27, which inherits the limitations of claim 26, the claimed system including the features that corresponds to subject matter mentioned above in the rejection of claim 13 is applicable hereto. Further IEEE standard further teach wherein the wideband channel has a wideband channel bandwidth of up to 80 MHz and comprises up to four of the sub-channels, wherein the sub-channels are non-overlapping orthogonal frequency division multiplexed channels, wherein each sub-channel has a sub-channel bandwidth of approximately 20 MHz and comprises a plurality of orthogonal sub carriers (see section 17.3.8.3.3 Channelization and table 88).

Regarding claim 28, which inherits the limitations of claim 26, the claimed system including the features that corresponds to subject matter mentioned above in the rejection of claim 21 is applicable hereto.

13. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitton et al. (USPAP 2004/0085917) in view of Supplement to IEEE Standard for IT-Telecommunications & Information Exchange Between Systems - Local and Metropolitan Area Networks - Specific Requirements. Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: High-Speed Physical Layer in 5GHZ Band, IEEE Standard 802.11a, Dec. 20 1999 (IEEE standard hereinafter) and further in view of Tarokh et al. (USPAP 2004/0235529).

Regarding claim 14, which inherits the limitations of claim 13, IEEE standard further teach wherein the wideband channel has a wideband channel bandwidth of up to 80 MHz and comprises up to four of the sub-channels, wherein the sub-channels are non-overlapping orthogonal frequency division multiplexed channels, wherein each sub-channel has a sub-channel bandwidth of approximately 20 MHz and comprises a plurality of orthogonal sub carriers (see section 17.3.8.3.3 Channelization and table 88). Fitton in view of IEEE standard does not expressly teach wherein the spatial channels are non-orthogonal frequency channels associated with one of the sub-channels whose orthogonality is achieved by beamforming. However in analogous art, Tarokh et al teach spatial channels are non-orthogonal frequency channels associated with one of the sub-channels whose orthogonality is achieved by beamforming (see paragraph 0117). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teachings of Tarokh et al in IEEE standard to reduce the interference.

Regarding claim 15, which inherits the limitations of claim 13, Fitton in view of IEEE standard and further in view of Tarokh et al further teach wherein the spatial channels are generated with a plurality of transmit antennas of a transmitting station performing the transmitting, each spatial channel carrying a separate data portion of a data unit comprising an orthogonal frequency-division multiplexed symbol.

14. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Supplement to IEEE Standard for IT-Telecommunications & Information Exchange

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Between Systems - Local and Metropolitan Area Networks - Specific Requirements.

Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY)

Specifications: High-Speed Physical Layer in 5GHZ Band, IEEE Standard 802.11a,

Dec. 20 1999 (IEEE standard hereinafter) in view of Knobel et al. (USPAP

2004/0032354).

Regarding claim 29, the claimed apparatus including features corresponding to subject matter mentioned above in the rejection of claim 1 is applicable hereto. IEEE standard does not expressly disclose these functions can be done in software. However in analogous art Knobel et al teach all transmitter functions can be done in software (see paragraph 0105). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to implement the cited transmitter in software to reduce hardware complexity.

Regarding claim 30, which inherits the limitations of claim 29, the claimed apparatus including features corresponding to subject matter mentioned above in the rejection of claim 2 is applicable hereto.

15. Claim 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Supplement to IEEE Standard for IT-Telecommunications & Information Exchange Between Systems - Local and Metropolitan Area Networks - Specific Requirements. Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: High-Speed Physical Layer in 5GHZ Band, IEEE Standard 802.11a,

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Dec. 20 1999 (IEEE standard hereinafter) in view of Fitton et al. (USPAP 2004/0085917) and further in view of Knobel et al. (USPAP 2004/0032354).

Regarding claim 31, which inherits the limitations of claim 29 (Examiner consider the claim as depending on claim 29), the claimed apparatus including features corresponding to subject matter mentioned above in the rejection of claim 6 is applicable hereto. IEEE standard in view of Fitton does not expressly disclose these functions can be done in software. However in analogous art Knobel et al teach all transmitter functions can be done in software (see paragraph 0105). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to implement the cited transmitter in software to reduce hardware complexity.

Allowable Subject Matter

16. Claims 10, 20 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaison Joseph whose telephone number is (571) 272-6041. The examiner can normally be reached on M-F 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jaison Joseph


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER